

CLAIMS:

1. A gas turbine engine comprising: a primary reduction gearbox enclosing a plurality of reduction gearbox bearings therewithin; at least a high pressure shaft rotatably supported by a plurality of high pressure shaft bearings and having a compressor and a turbine mounted thereto; a gas generator portion defining a shaft bearing cavity therewithin, the shaft bearing cavity containing at least the high pressure shaft bearings; and wherein the primary reduction gearbox and shaft bearing cavity are engaged in unrestricted oil flow communication and define a single oil cavity within which the reduction gearbox bearings and the high pressure shaft bearings are enclosed.
2. The gas turbine engine as defined in claim 1, further comprising an accessory gearbox having a plurality of accessory gearbox bearings, the accessory gearbox being in unrestricted oil flow communication with at least one of the shaft bearing cavity and the primary reduction gearbox such that the single oil cavity defined therewithin encompasses substantially all of the accessory gearbox bearings.
3. The gas turbine engine as defined in claim 1, further comprising a low pressure shaft concentrically mounted within the high pressure shaft and rotatably supported by low pressure shaft bearings, and wherein at least some of the low pressure shaft bearings are positioned within the single oil cavity.
4. The gas turbine engine as defined in claim 3, wherein the high pressure shaft surrounds the low pressure

shaft, and wherein at least one of the high pressure shaft bearings is inwardly spaced from a rear end thereof such that the high pressure shaft is cantilevered from the high pressure shaft bearings.

5. The gas turbine engine as defined in claim 1, wherein all of said high pressure shaft bearings are located forward of both the compressor and the turbine.

6. The gas turbine engine as defined in claim 1, wherein the single oil cavity comprises only a forward and a rear main shaft air seal to prevent oil therewithin from leaking out around the at least a high pressure shaft, thereby reducing secondary air flow fed into the single oil cavity to seal the oil therewithin.

7. The gas turbine engine as defined in claim 2, wherein the single oil cavity comprises an oil tank integral therewith and disposed at the bottom thereof, the single oil cavity being scavenged only by gravity.

8. A gas turbine engine comprising:

a casing;

a primary reduction gearbox having a plurality of reduction gearbox bearings and an accessory gearbox having a plurality of accessory gearbox bearings;

at least a first shaft having a compressor and turbine mounted thereto, the first shaft being rotatably supported by at least two shaft bearings; and

wherein the reduction gearbox, the accessory gearbox and the shaft bearings are disposed in a single

oil cavity within the casing, and wherein unrestricted oil flow is possible between the reduction gearbox bearings, the accessory gearbox bearings and said shaft bearings.

9. The gas turbine engine as defined in claim 8, further comprising a second shaft concentric within the first shaft and supported by at least two second shaft bearings, at least one of the second shaft bearings being contained in the single oil cavity.
10. The gas turbine engine as defined in claim 9, wherein all bearings of one of the first and second shafts are contained within the single oil cavity.
11. The gas turbine engine as defined in claim 8, wherein the shaft bearings are located forward of both the compressor and the turbine, thereby cantilevering the first shaft.
12. The gas turbine engine as defined in claim 8, wherein the single oil cavity comprises only a forward and a rear main shaft air seal to prevent oil within the single oil cavity from leaking out around said at least first shaft, thereby reducing secondary air flow fed into the single bearing cavity to seal the oil therewithin.
13. The gas turbine engine as defined in claim 8, wherein the single oil cavity comprises an oil tank integral therewith and disposed at the bottom thereof, the single oil cavity being scavenged only by gravity.

14. A gas turbine engine comprising at least outer and inner concentric shafts, at least said outer shaft having a compressor and turbine mounted thereto, each of said shafts being respectively rotatably supported by at least two outer shaft bearings and two inner shaft bearings, the outer shaft bearings being spaced apart from a turbine end of the outer concentric shaft such that the turbine is disposed between said bearing and said end, such that the outer concentric shaft is cantilevered from the outer shaft bearings.
15. The gas turbine engine as defined in claim 14, wherein all of said outer shaft bearings are located forward of both the compressor and the turbine mounted on said outer concentric shaft.
16. The gas turbine engine as defined in claim 15, wherein all of said outer shaft bearings are contained in a single oil cavity.
17. The gas turbine engine as defined in claim 16, wherein at least one of said inner shaft bearings is contained within said single oil cavity.
18. The gas turbine engine as defined in claim 16, further comprising a primary reduction gearbox having a plurality of reduction gearbox bearings, wherein said single oil cavity encompasses all of said reduction gearbox.
19. The gas turbine engine as defined in claim 18, further comprising an accessory gearbox having a plurality of accessory gearbox bearings, wherein

substantially all of said accessory gearbox bearings are contained within said single oil cavity.

20. A free turbine gas engine comprising at least outer and inner concentric shafts rotatably supported by a plurality of shaft bearings, the outer shaft being a free turbine shaft and having a turbine and compressor mounted thereto, the outer shaft bearings disposed forward of the compressor such that the bearings are isolated from the turbine.